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EXAMINER

GUARINO, RAHEL

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/815,887	<b>Applicant(s)</b> KUNNARI ET AL.	
	<b>Examiner</b> Rahel Guarino	<b>Art Unit</b> 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Response to Arguments*

1. This office action is in response to communication filed on 4/10/2008.
2. Applicant's arguments with respect to claims 1-34 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1-4, 8-14, 18-24 and 28-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horowitz et al. US, 7,142,612 in view of Svensson "IEEE Journal of solid-state circuits: A 3-level Asynchronous Protocol for a differential Two-Wire communication link"**

Re claim 1, Horowitz discloses a Multi-level Analog Signaling method comprising encoding data bits represented by multi-level analog signals comprising more than two

analog amplitude levels (fig. 1A; encoder (102); col. 3 lines 52-55); transmitting the encoded data bits over at least two multi-level signal buses between a transmitter and a receiver such that (fig. 1A (encoder (102)), receiver (110)); col. 3 lines 30-33 and col. 3 lines 60-61), on each multi-level signal bus (five-level signaling buses (104(1)-104(5))), during each data bit period the signal level is required to change from a first signal level to a second (col. 2 lines 30-35), different signal level (col. 1 lines 26-34); does not teach a data boundary to the receiver by holding one of the multi-level signal buses at the same level for at least two consecutive bit periods.

However, Svensson discloses a data boundary to the receiver by holding one of the multi-level signal buses at the same level for at least two consecutive bit periods (page 1130, section B, clock extractor”).

Therefore, taking the combined teaching of Horowitz and Svensson as a whole would have been rendered obvious to one skilled in the art to modify Svensson to holding one of the multi-level signal buses at the same level for at least two consecutive bit periods for the benefit of clock recovery without increasing signal bandwidth (page 1130, left column line 3-9, section II, “a balanced two-wire link carrying a three-state code”).

Re claim 2, the modified invention as claimed in claim 1, where encoding includes, when a data bit to be encoded is the same as the data bit encoded for an immediately prior bit period, encoding instead a strobe signal represented by a predetermined one of the levels of the multi-level analog signal (fig.6, page 1130 section A, “encoder and driver”), where the presence of the strobe signal at the receiver is used

to generate a clock edge (page 1130, section B, "clock extractor"," Svensson").

Re claim 3, the modified invention as claimed in claim 2, where the multi-level analog signal comprises a PAM-3 signal, where two analog signal levels convey the encoded data bits and one analog signal level conveys the strobe signal (page 1129, section II, "a balanced two-wire link carrying a three-state code"," Svensson").

Re claim 8, the modified invention as claimed in claim 1, further comprising transmitting a stream of data between the transmitter and the receiver by toggling one of the at least two multi-level signal buses between first and second signal levels to generate clock edges; and setting, so as to coincide with a generated clock edge, a signal level of another one of the at least two multi-level signal buses at a signal level representative of a logic zero signal level or a logic one signal level (page 1129, section II, "a balanced two-wire link carrying a three-state code", "Svensson").

Re claim 9, the modified invention as claimed in claim 8, where the receiver of the stream of data performs toggling the one of the at least two multi-level signal buses between the first and the second signal levels to generate clock edges (page 1130-1131 section B "clock extractor"," Svensson").

Re claim 10, the modified invention as claimed in claim 8, where a beginning and an end of the stream of data is signaled by setting at least one of the different signal buses to a third signal level (page 1129, section II, "a balanced two-wire link carrying a three-state code"," Svensson").

Re claim 11, Horowitz discloses A Multi-level Analog Signaling circuit arrangement comprising a transmitter to encode data bits represented by multi-level

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analog signals (fig. 1A; encoder (102); col. 3 lines 52-55); at least two multi-level signal buses coupled between said transmitter and a receiver for conveying the encoded data bits such that, on each multi-level signal bus (fig. 1A (encoder (102)), receiver (110)); col. 3 lines 30-33 and col. 3 lines 60-61), during each data bit period the signal level is required to change from a first signal level to a second (col. 2 lines 30-35), different signal level (col. 1 lines 26-34); does not teach a data boundary to the receiver by holding one of the multi-level signal buses at the same level for at least two consecutive bit periods.

However, Svensson discloses a data boundary to the receiver by holding one of the multi-level signal buses at the same level for at least two consecutive bit periods (page 1130, section B, clock extractor”).

Therefore, taking the combined teaching of Horowitz and Svensson as a whole would have been rendered obvious to one skilled in the art to modify Svensson to holding one of the multi-level signal buses at the same level for at least two consecutive bit periods for the benefit of clock recovery without increasing signal bandwidth ((page 1130, left column line 3-9, section II, “a balanced two-wire link carrying a three-state code”).

Re claim 12, the modified invention as claimed in claim 11, where said transmitter operates to encode data bits such that, when a data bit to be encoded is the same as the data bit encoded for an immediately prior bit period, the transmitter instead encodes a strobe signal represented by a predetermined one of the levels of the multi-level analog signal (fig.6, page 1130 section A, “encoder and driver”), where the

presence of the strobe signal at the receiver is used to generate a clock edge (page 1130, section B, "clock extractor", "Svensson").

Re claim 13, the modified invention as claimed in claim 12, where the multi-level analog signal comprises a PAM-3 signal, where two analog signal levels convey the encoded data bits and one analog signal level conveys the strobe signal (page 1129, section II, "a balanced two-wire link carrying a three-state code", "Svensson").

Re claim 14, the modified invention as claimed in claim 11, where the data boundary comprises one of the start or the end of a multi-bit frame (page 1130-1131, section B "clock extractor", "Svensson").

Re claim 18, the modified invention as claimed in claim 11, where said transmitter and said receiver cooperate to transmit a stream of data by toggling one of the at least two multi-level signal buses between first and second signal levels to generate clock edges, and by setting, so as to coincide with a generated clock edge, a signal level of another one of the at least two multi-level signal buses at a signal level representative of a logic zero signal level or a logic one signal level (page 1129, section II, "a balanced two-wire link carrying a three-state code", "Svensson").

Re claim 19, the modified invention as claimed in claim 18, where said receiver of the stream of data toggles the one of the at least two multi-level signal buses between the first and the second signal levels to generate clock edges (page 1130-1131 section B "clock extractor", "Svensson").

Re claim 20, the modified invention as claimed in claim 18, where a beginning

and an end of the stream of data is signaled by setting at least one of the different signal buses to a third signal level (page 1129, section II, “a balanced two-wire link carrying a three-state code”, “Svensson”).

Re claim 21, Horowitz discloses a Multi-level Analog Signaling method comprising encoding data bits represented by multi-level analog signals comprising more than two analog amplitude levels (fig. 1A; encoder (102); col. 3 lines 52-55); transmitting the encoded data bits over at least two multi-level signal buses between a transmitter and a receiver such that (fig. 1A (encoder (102)), receiver (110)); col. 3 lines 30-33 and col. 3 lines 60-61), on each multi-level signal bus (five-level signaling buses (104(1)-104(5))), during each data bit period the signal level is required to change from a first signal level to a second (col. 2 lines 30-35), different signal level (col. 1 lines 26-34); does not teach a data boundary to the receiver by holding one of the multi-level signal buses at the same level for at least two consecutive bit periods and a mobile station circuitry.

However, Svensson discloses a data boundary to the receiver by holding one of the multi-level signal buses at the same level for at least two consecutive bit periods (page 1130, section B, clock extractor”).

Therefore, taking the combined teaching of Horowitz and Svensson as a whole would have been rendered obvious to one skilled in the art to modify Svensson to holding one of the multi-level signal buses at the same level for at least two consecutive bit periods for the benefit of clock recovery without increasing signal bandwidth ((page 1130, left column line 3-9, section II, “a balanced two-wire link carrying a three-state



code”).

Re claim 22, the modified invention as claimed in claim 21, where said transmitter operates to encode data bits such that, when a data bit to be encoded is the same as the data bit encoded for an immediately prior bit period, the transmitter instead encodes a strobe signal represented by a predetermined one of the levels of the multi-level analog signal (fig.6, page 1130 section A, “encoder and driver”), where the presence of the strobe signal at the receiver is used to generate a clock edge (page 1130, section B, “clock extractor”, “Svensson”).

Re claim 23, the modified invention as claimed in claim 22, where the multi-level analog signal comprises a PAM-3 signal, where two analog signal levels convey the encoded data bits and one analog signal level conveys the strobe signal (page 1129, section II, “a balanced two-wire link carrying a three-state code”, “Svensson”).

Re claim 24, the modified invention as claimed in claim 21, where the data boundary comprises one of the start or the end of a multi-bit frame (page 1130-1131 section B “clock extractor”, “Svensson”).

Re claim 28, the modified invention as claimed in claim 21, where said transmitter and said receiver cooperate to transmit a stream of data by toggling one of the at least two multi-level signal buses between first and second signal levels to generate clock edges; and by setting, so as to coincide with a generated clock edge, a signal level of another one of the at least two multi-level signal buses at a signal level representative of a logic zero signal level or a logic one signal level (page 1129, section II, “a balanced two-wire link carrying a three-state code”, “Svensson”).

Re claim 29, the modified invention as claimed in claim 28, where said receiver of the stream of data toggles the one of the at least two multi-level signal buses between the first and the second signal levels to generate clock edges (page 1130-1131 section B "clock extractor", "Svensson").

Re claim 30, the modified invention as claimed in claim 28, where a beginning and an end of the stream of data is signaled by setting at least one of the different signal buses to a third signal level (page 1129, section II, "a balanced two-wire link carrying a three-state code", "Svensson").

Re claim 31, the modified invention as claimed in claim 21, where one of the said sub-assemblies comprises a cellular engine that is coupled to circuitry external to said mobile station via another port and data communication bus (page 1132, "conclusion", "Svensson").

Re claim 32, Horowitz discloses transmitter comprising encoding data bits represented by multi-level analog signals comprising more than two analog amplitude levels (fig. 1A; encoder (102); col. 3 lines 52-55); transmitting the encoded data bits over at least two multi-level signal buses between a transmitter and a receiver such that (fig. 1A (encoder (102)), receiver (110)); col. 3 lines 30-33 and col. 3 lines 60-61), on each multi-level signal bus (five-level signaling buses (104(1)-104(5))), during each data bit period the signal level is required to change from a first signal level to a second (col. 2 lines 30-35), different signal level (col. 1 lines 26-34); does not teach said transmitter indicating a data boundary to said receiver by holding one of the multi-level signal buses at the same level for at least two consecutive bit periods.

However, Svensson discloses a data boundary to the receiver by holding one of the multi-level signal buses at the same level for at least two consecutive bit periods (page 1130, section B, clock extractor”).

Therefore, taking the combined teaching of Horowitz and Svensson as a whole would have been rendered obvious to one skilled in the art to modify Svensson to holding one of the multi-level signal buses at the same level for at least two consecutive bit periods for the benefit of clock recovery without increasing signal bandwidth ((page 1130, left column line 3-9, section II, “a balanced two-wire link carrying a three-state code”).

Re claim 33, the modified invention as claimed in claim 34, where said encoding means operates to encode data bits such that, when a data bit to be encoded is the same as the data bit encoded for an immediately prior bit period, encoding means instead encodes a strobe signal represented by a predetermined one of the levels of the multi-level analog signal (fig.6, page 1130 section A, “encoder and driver”), where the presence of the strobe signal at the receiver is used to generate a clock edge (page 1130, section B, “clock extractor”, “Svensson”).

Re claim 34, the modified invention as claimed in claim 33, where the multi-level analog signal comprises a PAM-3 signal, where two analog signal levels convey the encoded data bits and one analog signal level conveys the strobe signal (page 1129, section II, “a balanced two-wire link carrying a three-state code”, “Svensson”).

**5. Claims 5-7, 15-17, 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horowitz et al. US, 7,142,612 in view of Svensson “IEEE Journal of solid-state circuits: A 3-level Asynchronous Protocol for a differential Two-Wire communication link” in further view Huang et al. US, 5,798,535.**

Re claim 5, the modified invention as claimed in claim 4 does not disclose multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between the transmitter and the receiver.

However, Huang teaches where the multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between the transmitter and the receiver (col. 1 line 42-54).

Therefore, taking the combined teaching of Horowitz, Svensson and Huang as a whole would have been rendered obvious to one skilled in the art to modify Svensson and Horowitz to utilize multi-bit frame within said mobile device for the benefit of full color display (col. 1 line 53-58).

Re claim 6, the modified invention as claimed in claim 4 does not disclose multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between a control unit of a mobile station and a display of the mobile station.

However, Huang teaches where the multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between a control unit of a mobile station and a display of the mobile station (col. 1 line 28-35).

Therefore, taking the combined teaching of Horowitz, Svensson and Huang as

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a whole would have been rendered obvious to one skilled in the art to modify Horowitz and Svensson to utilize a control unit of a mobile station for the benefit of emitting the required amount of light (35-40).

Re claim 7, the modified invention as claimed in claim 4 does not disclose multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between a control unit of a mobile station and a camera of the mobile station.

However, Huang teaches where the multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between a control unit of a mobile station and a display of the mobile station (col. 1 line 28-35).

Therefore, taking the combined teaching of Horowitz, Svensson and Huang as a whole would have been rendered obvious to one skilled in the art to modify Horowitz and Svensson to utilize a control unit of a mobile station for the benefit of emitting the required amount of light (35-40).

Re claim 15, the modified invention as claimed in claim 14 does not disclose multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between the transmitter and the receiver.

However, Huang teaches where the multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between the transmitter and the receiver (col. 1 line 42-54).

Therefore, taking the combined teaching of Horowitz, Svensson and Huang as a whole would have been rendered obvious to one skilled in the art to modify Horowitz and Svensson to utilize multi-bit frame within said mobile device for the benefit of full

color display (col. 1 line 53-58).

Re claim 16, the modified invention as claimed in claim 14 does not disclose multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between a control unit of a mobile station and a display of the mobile station.

However, Huang teaches where the multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between a control unit of a mobile station and a display of the mobile station (col. 1 line 28-35).

Therefore, taking the combined teaching of Horowitz, Svensson and Huang as a whole would have been rendered obvious to one skilled in the art to modify Horowitz and Svensson to utilize a control unit of a mobile station for the benefit of emitting the required amount of light (35-40).

Re claim 17, the modified invention as claimed in in claim 14 does not disclose multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between a control unit of a mobile station and a camera of the mobile station.

However, Huang teaches where the multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between a control unit of a mobile station and a display of the mobile station (col. 1 line 28-35).

Therefore, taking the combined teaching of Horowitz, Svensson and Huang as a whole would have been rendered obvious to one skilled in the art to modify Horowitz and Svensson to utilize a control unit of a mobile station for the benefit of emitting the required amount of light (35-40).

Re claim 25, the modified invention as claimed in claim 24 does not disclose

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multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between the transmitter and the receiver.

However, Huang teaches where the multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between the transmitter and the receiver (col. 1 line 42-54).

Therefore, taking the combined teaching of Horowitz, Svensson and Huang as a whole would have been rendered obvious to one skilled in the art to modify Horowitz and Svensson to utilize multi-bit frame within said mobile device for the benefit of full color display (col. 1 line 53-58).

Re claim 26, the modified invention as claimed in claim 24 does not disclose multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between a cellular engine of said mobile station and a display of said the mobile station.

However, Huang teaches where the multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between data between a cellular engine of said mobile station and said a display of the mobile station (col. 1 line 28-35).

Therefore, taking the combined teaching of Horowitz, Svensson and Huang as a whole would have been rendered obvious to one skilled in the art to modify Horowitz and Svensson to utilize data between data between a cellular engine of said mobile station for the benefit of emitting the required amount of light (35-40).

Re claim 27, the modified invention as claimed in claim 24 does not disclose multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between a cellular engine of said mobile station and a camera of said mobile station.

However, Huang teaches where the multi-bit frame comprises at least 24 bits for conveying 8-bit Red, Green and Blue data between a cellular engine of said mobile station and a camera of said mobile station (col. 1 line 28-35).

Therefore, taking the combined teaching of Horowitz, Svensson and Huang as a whole would have been rendered obvious to one skilled in the art to modify Horowitz and Svensson to utilize data between a cellular engine of said mobile for the benefit of emitting the required amount of light (35-40).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rahel Guarino whose telephone number is 571-270-1198. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Payne David can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RG

/David C. Payne/  
Supervisory Patent Examiner, Art Unit 2611